

## **REMARKS**

Reconsideration and withdrawal of the rejections set forth in the Office Action dated July 18, 2003 are respectfully requested.

Claims 1-32 remain pending in this application. Claims 11, 16-19 and 32 have been withdrawn as the result of an earlier restriction requirement and election of species.

In view of the examiner's earlier restriction requirement, applicants retain the right to present claims 11, 16-19 and 32 in a divisional application.

### **I. Amendments**

Claim 1 has been amended to replace the term "at or near atmospheric pressure" with "in an open atmosphere." Support for this amendment may be found in the specification on page 8, lines 16-18.

Claims 6, 8, 14 and 26 have been amended to overcome Section 112, second paragraph rejections made by the Examiner, as discussed below.

No new matter has been added by this amendment.

### **II. Rejections under 35 U.S.C. § 112, second paragraph**

Claims 6, 8-24 and 26-31 were rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. These rejections are traversed in view of the following.

Claim 6 was rejected for using the term "PTFE." The claim has been amended to replace the term "PTFE" with polytetrafluoroethylene. Support for this amendment may be found in the specification on page 7, line 30.

Claim 14 was rejected for using the term "P15." This claim has been amended to replace the term "P15" with its corresponding sequence identification number. Support for this amendment may be found on page 14, line 18 of the specification.

Claim 8 was rejected as being unclear with regard to when and how the limitation in the claim, and its dependants, fits in with steps (a)-(d) of the independent claim. Claim 8 has been amended to clarify that contacting the surface with a bioactive or biocompatible agent follows

step (c) or optional step (d). Support for this amendment may be found on page 12, lines 7-9 of the specification.

Claims 26-31 were rejected as being vague and indefinite for further limiting a limitation which is not positively claimed. Claim 26 has been amended to positively recite step (d) of claim 1 such that claims 27-31 further limit positive claim limitations.

Accordingly, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. §112, second paragraph.

### **III. Rejections under 35 U.S.C. § 102**

Claims 1-2, 5-6, 8-10, 12-13, and optionally 26-31 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Application No. 2003/0008397A1 (Beaumer *et al.*).

Claims 1-2, 5-6, 8-9, 25 and optionally 26-31 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,743,258 (Ikada *et al.*).

These rejections are respectfully traversed in view of the foregoing claim amendments and following remarks.

#### **A. The Invention**

The present invention, as embodied in amended claim 1, is directed to a method of forming on the surface of a substrate a coating having a selected surface density of a selected chemical group. The method includes treating the surface with a plasma formed in an open atmosphere to form one or more active species on the surface; continuing the treating until a desired surface density of the active species is formed; and exposing the treated surface to a selected gas or liquid under conditions effective to convert the active species to a stable functional group.

As noted in the specification, this open atmospheric process eliminates the need for special equipment such as vacuum chambers and allows substrates of various shapes and sizes to be uniformly treated.

B. The Applied References

Beaumer et al. is directed to a process for coupling an adhesive glycoprotein to a surface of a material by depositing a polymer layer on the surface of the material and then coupling the glycoprotein to the polymer layer. The polymer layer functions as an interfacial bonding layer. The polymer is typically deposited at a reduced pressure, but atmospheric pressure may be used with "suitable equipment" (paragraph 0012). Nowhere does Beaumer show or suggest treating a surface with a plasma formed in an open atmosphere to create active species on the surface, nor does Beaumer disclose exposing the treated surface to a selected gas or liquid under conditions effective to convert the active species to a stable functional group.

Ikada et al. discloses a blood-compatible material that includes a polymeric base material and water-soluble and substantially nonionic polymers directly attached to the surface of the base material. Ikada treats the material with either a corona discharge at atmospheric pressure or a low-temperature plasma at 0.04 Torr. Nowhere does Ikada show or suggest treating a surface with a plasma formed in an open atmosphere to create active species on the surface.

C. Analysis

For a prior art reference to be anticipating under Section 102, it must teach "each and every" element of the claimed invention. *In re Bond*, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990). "Anticipation requires identity of invention: the claimed invention, as described in appropriately construed claims, must be the same as that of the reference, in order to anticipate." *Glaverbel Societe Anonyme v. Northlake Marketing & Supply, Inc.*, 33 USPQ2d 1496 (Fed. Cir. 1995).

The present invention, as amended, requires treating the surface with a plasma formed in an open atmosphere. As discussed above, neither Beaumer nor Ikada disclose this element. Therefore, Beaumer or Ikada cannot anticipate the claimed invention. Accordingly, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §102.

**IV. Rejections under 35 U.S.C. § 103**

Claims 3-4, 7, 14-15 and 21-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Beaumer *et al.* (U.S. Application No. 2003/0008397A1), optionally in view of Valentini (U.S. Patent No. 6,428,579) or Clapper (U.S. Patent No. 5,744,515).

Claims 3-4, 7 and 21-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ikada *et al.*

These rejections are respectfully traversed in view of the foregoing claim amendments and following remarks.

**A. The Invention**

The invention is discussed above.

**B. The Applied References**

Beaumer *et al.* is described above.

Valenti discloses implantable prosthetic devices having a gold layer on the surface to which bioactive molecules are attached. This reference does not disclose the use of a plasma formed in an open atmosphere to treat the disclosed devices.

Clapper is directed to a porous material having a surface chemistry that promotes capillary endothelialization. The reference does not show or suggest the use of a plasma formed in an open atmosphere to treat the porous material.

Ikada *et al.* is discussed above.

**C. Analysis**

According to the MPEP § 2143, "to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a

reasonable expectation of success. Third, the prior art references (or references when combined) must teach or suggest all the claim limitations."

As noted above, none of the references shows or suggests forming the plasma in an open atmosphere. Therefore, the references do not teach or suggest all of the claim limitations. The specification of the Beaumer *et al.* patent makes clear that the volatile aldehyde is used to deposit a polymer layer. Although Beaumer suggests that the plasma used to form this layer might be formed at atmospheric pressure, there is no suggestion that the plasma may be formed in an open atmosphere. The other cited references do not make up for the deficiency of Beaumer. Even if these elements were disclosed in the cited references, the references do not recognize the advantages of the invention, and thus provide no motivation for combining elements along the lines of the invention.

Furthermore, modifying the Beaumer reference to allow the plasma to be formed in an open atmosphere would cause the volatile aldehyde to become oxidized, which would inhibit or prevent the formation of a polymer layer. Thus, this type of modification would defeat the purpose of Beaumer. A modification which defeats the purpose of a primary reference, or renders it inoperative, cannot be considered obvious. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Schulpen*, 157 USPQ 52 (CCPA 1968). A reference teaches away if it leaves the impression that the product would not have the property sought by the applicant. *In re Caldwell*, 319 F.2d 254, 256, 138 USPQ 243, 245 (CCPA 1963). In contrast, the presently claimed invention is not directed to the formation of a polymer layer; the use of the plasma formed in an open atmosphere encourages the formation of active species on the surface.

In conclusion, the Applicants submit that:

- i) the references do not teach or suggest all the claim limitations;
- ii) none of the references, taken singly or in combination, provides motivation for combining the references along the lines of the invention; and
- iii) the proposed modification of Beaumer to form the plasma in an open atmosphere would defeat the purpose of the primary reference.

The dependent claims incorporate all of the subject matter of the base claim and add additional subject matter, which makes them *a fortiori* and independently patentable over Beaumer *et al.*, Valentini, Clapper and Ikada *et al.*

**VI. Conclusion**

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (650) 838-4405.

Respectfully submitted,

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